

CLAIMS

1. A wound-healing promoting material which comprises a sheet-like porous body having on its surface at least leukocytes and/or platelets.
2. A wound-healing promoting material which comprises a sheet-like porous body and has a cell-proliferating potency.
3. The wound-healing promoting material according to claim 2 having a fibroblast-proliferating potency.
4. The wound-healing promoting material according to claim 3, wherein the cell-proliferating potency is derived from the leukocytes and/or platelets on the surface of the sheet-like porous body.
5. A wound-healing promoting material which comprises a sheet-like porous body and has a growth factor-producing potency.
6. The wound-healing promoting material according to claim 5, which satisfies any of the following conditions: the growth factor-producing potency is 5 times or more as compared with the control plasma in case of vascular endothelial growth factor (VEGF), the growth factor-producing potency is 2 times or more as compared with the control plasma in case of platelet-derived growth factor-AB (PDGF-AB); or the growth factor-producing potency is 2 times or more as compared with the control plasma in case of transforming growth factor- β 1 (TGF- β 1).
7. The wound-healing promoting material according to claim 6, wherein the growth factor-producing potency is derived from the leukocytes and/or platelets on the surface of the sheet-like porous body.
8. The wound-healing promoting material according to any of claims 1 to 7, wherein the sheet-like porous body has a thickness of 0.01 mm to 3 mm.
9. The wound-healing promoting material according to any of claims 1 to 8, wherein the shape of the sheet-like porous body can be altered in accordance with the shape of the wound site.
10. The wound-healing promoting material according to claim 9, wherein the

sheet-like porous body is made of a nonwoven fabric.

11. The wound-healing promoting material according to claim 10, wherein the nonwoven fabric has a fiber diameter of 0.3 μm to 50 μm and a bulk density of 0.05 g/cm³ to 0.5 g/cm³.

12. The wound-healing promoting material according to claim 9, wherein the sheet-like porous body is a sponge construct.

13. The wound-healing promoting material according to claim 12, wherein the sponge construct has an average pore diameter of 1.0 μm to 40 μm .

14. The wound-healing promoting material according to any of claims 1 to 13, wherein the sheet-like porous body is made of a natural or synthetic polymer.

15. The wound-healing promoting material according to claim 14, wherein the sheet-like porous body is made of a synthetic polymer mainly composed of a hydrophobic polymer.

16. The wound-healing promoting material according to claim 13 or 14, wherein the sheet-like porous body is made of a biodegradable material.

17. The wound-healing promoting material according to any of claims 1 to 16, wherein the leukocytes and/or platelets are derived from the peripheral blood, bone marrow fluid, or umbilical cord blood.

18. The wound-healing promoting material according to any of claims 1 to 16, wherein the leukocytes and/or platelets are mature cells.

19. The wound-healing promoting material according to claim 17 or 18, wherein the leukocytes and/or platelets are derived from autologous blood.

20. The wound-healing promoting material according to any of claims 1 to 19, wherein the sheet-like porous body has a leukocyte density of 6.0×10^6 cells/cm³ or higher and/or a platelet density of 2.5×10^8 cells/cm³ or higher.

21. The wound-healing promoting material according to any of claims 1 to 20, wherein the sheet-like porous body comprises fibroblasts incorporated therein.

22. The wound-healing promoting material according to claim 21, wherein the fibroblasts are derived from tissue that is the same as the wounded tissue.

23. The wound-healing promoting material according to any of claims 1 to 22, wherein the sheet-like porous body comprises fibrins.

24. A method for preparing a wound-healing promoting material which comprises a step of trapping at least leukocytes and/or platelets in a sheet-like porous body.

25. The method for preparing a wound-healing promoting material according to claim 24, wherein the sheet-like porous body has a thickness of 0.01 mm to 3 mm.

26. The method for preparing a wound-healing promoting material according to claim 24 or 25, wherein the sheet-like porous body is made of a nonwoven fabric.

27. The method for preparing a wound-healing promoting material according to claim 26, wherein the nonwoven fabric has a fiber diameter of 0.3 μm to 50 μm and a bulk density of 0.05 g/cm³ to 0.5 g/cm³.

28. The method for preparing a wound-healing promoting material according to claim 24 or 25, wherein the sheet-like porous body is a sponge construct.

29. The method for preparing a wound-healing promoting material according to claim 28, wherein the sponge construct has an average pore diameter of 1.0 μm to 40 μm .

30. The method for preparing a wound-healing promoting material according to any of claims 24 to 29, wherein the sheet-like porous body is capable of selective separation of blood cells.

31. The method for preparing a wound-healing promoting material according to claim 30, wherein the surface of the sheet-like porous body is capable of selective separation of blood cells.

32. The method for preparing a wound-healing promoting material according to claim 31, wherein the sheet-like porous body traps leukocytes and/or platelets more selectively than erythrocytes.

33. The method for preparing a wound-healing promoting material according to claim 32, wherein the rate of the sheet-like porous body to trap leukocytes is 50% or higher, and/or the rate of the sheet-like porous body to trap platelets is 50% or higher.

34. The method for preparing a wound-healing promoting material according to

any of claims 24 to 33, wherein a cell suspension containing at least leukocytes and/or platelets is trapped in a sheet-like porous body via filtration.

35. The method for preparing a wound-healing promoting material according to claim 34, wherein filtration is carried out in a once-through system.

36. The method for preparing a wound-healing promoting material according to claim 35, wherein the amount of cell suspension to be filtered is less than 400 ml.

37. The method for preparing a wound-healing promoting material according to any of claims 35 to 37, wherein the amount of filtrate per effective filtration area of the sheet-like porous body is less than 10 ml/cm².

38. The method for preparing a wound-healing promoting material according to any of claims 35 to 37, wherein the ratio of the amount of filtrate to the volume of the sheet-like porous body is less than 100.

39. The method for preparing a wound-healing promoting material according to any of claims 35 to 38, wherein a cell suspension is filtered once through the sheet-like porous body.

40. The method for preparing a wound-healing promoting material according to any of claims 35 to 40, wherein a cell suspension is unidirectionally filtered through the sheet-like porous body.

41. The method for preparing a wound-healing promoting material according to any of claims 35 to 40, wherein the filtration time is within 20 minutes.

42. The method for preparing a wound-healing promoting material according to claim 34, wherein filtration is carried out via extracorporeal circulation.

43. The method for preparing a wound-healing promoting material according to claim 42, wherein the filtration velocity is 20 ml/min to 200 ml/min.

44. The method for preparing a wound-healing promoting material according to claim 42 or 43, wherein the filtration time is 10 to 300 minutes.

45. The method for preparing a wound-healing promoting material according to any of claims 24 to 44, wherein the cell suspension is fresh blood.

46. The method for preparing a wound-healing promoting material according to

claim 45, wherein the cell suspension is fresh blood used within 48 hours after sampling.

47. The method for preparing a wound-healing promoting material according to any of claims 24 to 46, wherein the cell suspension mainly comprises mature cells.

48. The method for preparing a wound-healing promoting material according to any of claims 24 to 47, wherein the cell suspension is derived from autologous blood.

49. The method for preparing a wound-healing promoting material according to any of claims 24 to 48, wherein the cell suspension contains citrate, heparins, or a hydrolase inhibitor as an anticoagulant.

50. The method for preparing a wound-healing promoting material according to any of claims 24 to 49, which further comprises a step of culturing a sheet-like porous body in which at least leukocytes and/or platelets have been trapped.

51. The method for preparing a wound-healing promoting material according to claim 50, wherein a cell activator is added at the time of culturing.

52. The method for preparing a wound-healing promoting material according to any of claims 24 to 51, which further comprises a step of incorporating fibroblasts into a sheet-like porous body.

53. The method for preparing a wound-healing promoting material according to claim 52, wherein fibroblasts are brought into contact with a sheet-like porous body or mixed with a cell suspension, followed by filtration, to incorporate the fibroblasts into the sheet-like porous body.

54. The method for preparing a wound-healing promoting material according to claim 53, wherein the fibroblasts are derived from tissue that is the same as the wounded tissue.

55. The method for preparing a wound-healing promoting material according to any of claims 24 to 54, which further comprises a step of incorporating fibrins into the sheet-like porous body.

56. The method for preparing a wound-healing promoting material according to claim 55, wherein the fibrins are derived from a pharmaceutical preparation.

57. The method for preparing a wound-healing promoting material according to

claim 56, wherein the fibrins are those obtained by recovering drainage resulting from the filtration of a cell suspension through the sheet-like porous body, followed by concentration.

58. The method for preparing a wound-healing promoting material according to any of claims 24 to 57, which further comprises a step of washing the sheet-like porous body following a step of trapping at least leukocytes and/or platelets.

59. The method for preparing a wound-healing promoting material according to any of claims 24 to 58, wherein a step of trapping at least leukocytes and/or platelets in the sheet-like porous body and/or a step of washing the sheet-like porous body are/is carried out in an openable liquid-tight container equipped with a liquid inlet and a liquid outlet.

60. The method for preparing a wound-healing promoting material according to claim 59, which further comprises a step of removing the sheet-like porous body from the openable liquid-tight container and preserving the porous body.

61. A wound-healing promoting material which is obtained by the method for preparing a wound-healing promoting material according to any of claims 24 to 60.

62. A device for preparing a wound-healing promoting material which comprises an openable liquid-tight container equipped with an inlet and an outlet for liquid injection and discharge, wherein a sheet-like porous body is positioned in a manner such that the interior of the container is divided into two sections, and the one end is connected to the inlet and the other end is connected to the outlet.

63. The device for preparing a wound-healing promoting material according to claim 62, which is a soft device prepared by sandwiching the sheet-like porous body between flexible resin sheets and welding them or causing them to adhere to each other, wherein the sheet-like porous body therein can be exposed or removed therefrom by peeling of the flexible resin sheets.

64. The device for preparing a wound-healing promoting material according to claim 63, which is a flat plate.

65. The device for preparing a wound-healing promoting material according to

claim 62, which is a hard device equipped with a means of sealing, wherein the sheet-like porous body therein can be exposed or removed therefrom by release of the means of sealing.

66. The device for preparing a wound-healing promoting material according to claim 65, which is a cylinder.

67. The device for preparing a wound-healing promoting material according to claim 66, wherein the sheet-like porous body is wound into a roll and is contained.

68. The device for preparing a wound-healing promoting material according to any of claims 62 to 67, wherein the sheet-like porous body has a thickness of 0.01 mm to 3 mm.

69. The device for preparing a wound-healing promoting material according to any of claims 62 to 68, wherein the sheet-like porous body is made of a nonwoven fabric.

70. The device for preparing a wound-healing promoting material according to claim 69, wherein the nonwoven fabric has a fiber diameter of 0.3 μm to 50 μm and a bulk density of 0.05 g/cm³ to 0.5 g/cm³.

71. The device for preparing a wound-healing promoting material according to any of claims 62 to 68, wherein the sheet-like porous body is a sponge construct.

72. The device for preparing a wound-healing promoting material according to claim 71, wherein the sponge construct has an average pore diameter of 1.0 μm to 40 μm .

73. The device for preparing a wound-healing promoting material according to any of claims 62 to 72, wherein the sheet-like porous body is capable of selective separation of blood cells.

74. The device for preparing a wound-healing promoting material according to claim 73, wherein the surface of the sheet-like porous body is capable of selective separation of blood cells.

75. The device for preparing a wound-healing promoting material according to claim 74, wherein the sheet-like porous body traps leukocytes and/or platelets more selectively than erythrocytes.

76. The device for preparing a wound-healing promoting material according to claim 75, wherein the rate of the sheet-like porous body to trap leukocytes is 50% or higher, and/or the rate of the sheet-like porous body to trap platelets is 50% or higher.

77. The device for preparing a wound-healing promoting material according to any of claims 62 to 76, wherein the container is equipped with connecting parts connectable to bags on its inlet and/or outlet side(s).

78. The device for preparing a wound-healing promoting material according to claim 77, wherein the container is equipped with a blood-sampling bag on its inlet side and/or a centrifuge bag on its outlet side.

79. The device for preparing a wound-healing promoting material according to any of claims 62 to 76, wherein the container is equipped with extracorporeal circulation circuits on its inlet and outlet sides.

80. The device for preparing a wound-healing promoting material according to any of claims 62 to 79, which is packaged and sterilized in a sterile bag.

81. The device for preparing a wound-healing promoting material according to claim 77, wherein the inlet and the outlet of the container are connected to the exterior and packaged in that state, and the whole apparatus is packaged and sterilized in a sterile bag.

82. A wound-healing promoting material, which is obtained by using the device for preparing a wound-healing promoting material according to any of claims 62 to 81.

83. A method for treating a wound site which comprises applying the wound-healing promoting material according to any of claims 1 to 23, 61, or 82 to the wound site.

84. The method for treating a wound site according to claim 83, wherein the container is opened and a sheet-like porous body is applied to the wound site while the surface thereof is exposed from the container.

85. The method for treating a wound site according to claim 84, wherein the sheet-like porous body is removed from the container and applied to the wound site.

86. The method for treating a wound site according to any of claims 83 to 85,

wherein the wound-healing promoting material is applied to the wound site within 30 minutes after preparation thereof.

87. The method for treating a wound site according to any of claims 83 to 86, wherein the wound exists on the body surface.

88. The method for treating a wound site according to any of claims 83 to 87, wherein the applied wound-healing promoting material is covered and sealed with a protector.

89. The method for treating a wound site according to claim 88, wherein the protector is a sheet made of a material having no water permeability.

90. The method for treating a wound site according to claim 89, wherein the protector is a sheet made of a material having gas permeability and having no water permeability.